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ABSTRACT

This study examined (1) whether students taught by National Board for Professional Teaching Standards (NBPTS)-certified teachers would produce higher quality work than students of teachers who attempted NBPTS certification but were not certified; (2) whether the observed classroom behaviors of NBPTS-certified teachers would be demonstrably different from those of teachers who attempted certification but were not certified; and (3) whether NBPTS-certified teachers and teachers who were not certified would differ in the number, variety, and nature of professional activities and involvement. The study sample included 65 teachers from 3 states who had sought NBPTS certification. Data collection involved classroom observations, teacher surveys regarding their lesson planning and teaching philosophy, and student surveys immediately following the observed lessons. Casebooks were made for each of the 65 teachers, with information including the questionnaire, the narrative record, the classroom observation protocol, the lesson transcript, student interviews, and teacher interviews. Researchers also conducted telephone interviews with 40 traditionally-certified teachers and 40 NBPTS-certified teachers. Finally, researchers analyzed the writing scores and work samples of students who had been taught by NBPTS-certified and non-NBPTS teachers. This report presents plans for scoring and analyzing the data. (SM)

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PRELIMINARY ANALYSIS REPORT: CONSTRUCT VALIDITY STUDY OF THE NATIONAL BOARD FOR PROFESSIONAL TEACHING STANDARDS'

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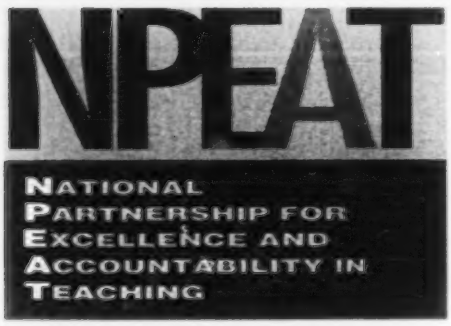

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1.1.1 Construct and Consequential Validity Study of NBPTS

Preliminary Analysis Report

National Commission on Teaching & America's Future
Teachers College
Columbia University

May 30, 2000

Preliminary Analysis Report:
Construct Validity Study of the National Board for Professional Teaching Standards' Assessments

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May 2000

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Introduction

The National Board for Professional Teaching Standards' system of advanced, voluntary certification for k-12 teachers represents the state-of-the-art in complex performance assessment of teaching. The six site-based portfolio exercises and the four on-demand assessment center exercises constitute the most comprehensive assessment of teaching yet devised. Although the assessment entails exercises that contain student work which the candidate must discuss and analyze, student achievement and the quality of student products, per se, are not a part of the assessment. Moreover, although candidate teachers must submit two video tapes (and associated commentary) which feature their instructional expertise in whole class and small group settings, the NBPTS assessment does not entail actual classroom visitation and observation by trained observers.

The present investigation is intended to provide relevant information on these two aspects of the NBPTS assessment system. More specifically, the present study will attempt to provide answers to the following two questions:

1. Do students who have been taught by a National Board Certified teacher produce higher quality work than students of teachers who attempted certification but were not certified?
2. On the basis of observation protocols that were developed separately and apart from the National Board, are the observed classroom practices of National Board certified teachers demonstrably different from those of teachers who attempted certification but were not certified?

A third question addressed in the study involves a comparative examination of the extent and type of professional activities and involvement of Board certified teachers versus teachers who were not certified. More specifically,

3. Do National Board certified teachers and teachers who were not certified differ in the number, variety, and nature of their professional activities and involvement?

This report will provide a brief summary of the data collection activities, and plans for scoring and analyzing the data.

Comparative Teaching Practices and Outcomes

Fourteen dimensions of expert teaching

Through a comprehensive review of the literature on expertise in teaching as well as other domains, we have identified the following 14 dimensions of expert teaching that will be used to answer the first two questions in the previous section:

1. *Content knowledge.* The expert has a deep understanding of the content to be taught to students.
2. *Pedagogical knowledge.* The expert transforms essential aspects of subject matter to connect with students' ways of understanding. These transformations include the following:
   - *2A Identifying essential representations*
     - 2A1 Expert teachers have deeper representations about teaching and learning.
     - 2A2 Expert teachers are problem solvers.
   - *2B Setting goals for diverse learners*
     - 2B1 Expert teachers can anticipate, plan, and improvise.
   - *2C Guiding learning through classroom interactions*
     - 2C1 Expert teachers have excellent proficiency for creating an optimal classroom climate for learning.
     - 2C2 Expert teachers have a multidimensional perception of class situations.

2C3 Expert teachers are more context-dependent and have high situation cognition.

2D Monitoring learning and providing feedback

2D1 Expert teachers are more adept at monitoring and provide much feedback to students.

2D2 Expert teachers are more able to check and test-out their hypotheses or strategies.

3. *Affective attributes.* The expert teacher has the following affective attributes:

3A High respect for students

3B Much passion about teaching and learning

4. *Learning outcomes.* The expert teacher promotes the following:

4A Motivation & Self-efficacy

4C Challenge of objectives

4D Outcomes of lessons: deep understanding and achievement

The teacher sample

The sample included 65 teachers from throughout North Carolina, Ohio, and the Washington, DC area who have sought National Board certification as either Middle Childhood Generalists (MCGen) or Early Adolescence/English Language Arts teachers (EA/ELA). The sample consisted of teachers whose final assessment score falls within four score groups that have been identified for comparison, as follows:

Score Group	***Candidates whose total score on the assessment is:***
1	at least one and one-fourth standard deviations below the passing score
2	between one-fourth, and three-fourths of a standard deviation below the passing score
3	between one-fourth, and three-fourths of a standard deviation above the passing score
4	at least one and one-fourth standard deviations above the passing score

The following table shows the demographic composition of the teacher sample.

		EA/ELA		MC/Gen	
		White	African American	White	African American
Score Group	1	7	3	4	3
	2	10	1	5	1
	3	5		8	2
	4	7	1	7	1

Data collection procedures

The primary data collection activity for this portion of the study involved observing classroom instruction related to a unit of instruction that had previously been described by the teacher. Prior to the classroom visit, the teacher completed an open-ended questionnaire in which she described how she planned the lesson to be observed, and also discussed her teaching philosophy.

A pair of trained observers, blind as to the teacher's certification status, visited the classroom and observed one to three hours of instruction. Observer One coded the Narrative Record, an open-ended form on which the observer described classroom activity and teacher-student interactions. Observer Two coded the Observation Protocol, a structured observation form on which the observer coded the amount and nature of feedback, management strategies, and off-task behaviors. Immediately following the lesson, the observers conducted structured interviews of three randomly-selected students from the class that they had observed. Following the student interviews, the observers conducted a structured interview of the teacher. The lesson, student interviews, and teacher interview were tape recorded and later transcribed.

At the conclusion of the visit, the observers each completed semantic differential scales consisting of Likert-scale items designed to measure the degree of passion and multidimensionality exhibited by the teacher.

The observers left a packet of teacher and student questionnaires and grade-appropriate writing prompts to be administered and returned at a later date. Along with the packet of completed questionnaires and writing samples, the teacher submitted a log of all assignments made during the instructional unit and all work submitted by four randomly-selected students in response to those assignments.

The Pre-observation Questionnaire, Narrative Record, Observation Protocol, and transcriptions of the lesson and interviews were stripped of potentially identifying information and compiled into a casebook for scoring.

Comparative Professional Activities and Agencies' Use of NBCTs

In order to investigate the extent to which National Board Certified teachers differ from non-certified teachers in the amount and type of professional activity, we designed and administered an extensive telephone interview protocol to a sample of 40 MC/Gen and EA/ELA candidates from across the United States.

We also explored the ways in which various agencies are making use of the expertise of National Board Certified teachers by interviewing a sample of 40 NBCTs from all certificate areas across the United States.

Analytical Procedures

The focus of the analytical procedures we intend to employ centers on distinguishing between Board certified teachers and non-certified teachers. Several

multivariate procedures will be employed. As described in more detail elsewhere, the database consists of a multi-component casebook for each teacher, student work and writing samples, and both teacher and student questionnaires. The intended analytical strategy contemplates separate analyses of each major data source. In addition to the analyses described below, summary descriptive statistics (means and standard deviations) for all dimensions, student work, and questionnaires will be provided for both certified and non-certified teachers.

Analysis of Teaching Practice: Casebooks

As noted earlier, the casebooks for each of the 65 teachers in the sample contain information on teaching competence from six sources: the pre-observation questionnaire, the narrative record, the classroom observation protocol, the lesson transcript, student interviews, and teacher interviews. Scorers are being trained to examine each casebook component systematically for evidence of each of the 14 teaching dimensions. They then make a holistic dichotomous (0-1) judgment in response to the following question: Taken in total, is the overall evidence present in this casebook regarding dimension X indicative of an accomplished teacher?

The above process results in a 14 element 0-1 vector for each teacher in the sample. These data will be analyzed via a discriminant function analysis (DFA). Discriminant function analysis obtains that linear combination of the 14 dimensions that maximally discriminates between certified and non-certified teachers. It thus provides information regarding one of the essential questions of the study, "Can National Board Certified teachers be reliably distinguished from non-Board Certified teachers on the basis

of relevant information about their classroom practice?" In addition to a test of the statistical significance of the discrimination, DFA provides discriminant function weights for each dimension. DFA weights allow us to determine precisely which dimension(s) contribute most and which contribute least to the discrimination. It is noted in passing that a two-group discriminant function analysis, like the one proposed here, is formally identical to an ordinary multiple regression with a dichotomous dependent variable. Thus, in this special case, DFA weights and regression weights are identical.

Analysis of Teaching Outcomes: Student Writing and Work Samples

The two sources of "student achievement" in this investigation were (1) writing samples to grade-appropriate writing prompts provided by the research team, and (2) work samples of four randomly-selected students per teacher produced in response to assignments made as part of the specific unit of instruction observed during the visitation. For reasons outlined below, these indices of student achievement will be analyzed separately.

Before describing procedures used to examine the relationship between student achievement and National Board Certification, it is necessary to briefly state the rationale for our choice of measures of student achievement. We appreciate the intense interest in the question "Do students who have been instructed by National Board Certified teachers obtain higher scores on standardized measures of academic achievement than students who have not been taught by NBCTs?" Nevertheless, a simple comparison of mean scores on standardized achievement tests of students who have been instructed over the past academic year by NBCTs versus those who were not is misguided. First, such a

comparison ignores other powerful influences on standardized measures such as socio-economic status. Even if one could control for such effects, a simple mean comparison would still be inappropriate. It is simply unrealistic to expect student performance on off-the-shelf, multiple-choice achievement tests to be measurably sensitive to differences between teachers in a single academic year. This is especially so since the relationship between what teachers are teaching and the content of various standardized tests varies widely from state to state, district to district, school to school, and indeed from classroom to classroom.

Student Writing. In the analysis of the writing sample data, we will compare writing scores of students of NBCTs with those of students of non-NBCTs after controlling for entering ability as indexed by achievement test scores. Ideally, we would prefer to condition on an entering test of writing ability, but no such measure is available. We fully appreciate that scores on multiple-choice achievement tests are at best a compromise covariate.

Student work samples. In a small preliminary study, Hattie et al. (1996) noted a tendency for students taught by NBCTs to differ not so much in how much they knew, but in the quality of their knowledge and understanding. That is, he found that students taught by NBCTs, when compared to those taught by non-NBCTs, tended to exhibit a greater depth of understanding of a given subject. In particular, students taught by NBCTs produced work and provided oral explanations of concepts that indicated understanding at a deeper level than students taught my non-NBCTs. If confirmed with larger samples, this is a potentially important finding. We will subject Hattie's preliminary conclusion to a more thorough test with the larger sample obtained in the present investigation. Biggs &

Collis (1982) has developed a SOLO taxonomy and associated scoring scheme that allows student productions to be evaluated on a 4-point scale from "1", a "surface" understanding of a concept to "4", a "deep structure" understanding.

The approximately 260 student work samples produced in response to assignments made during the observed unit of instruction will be scored using the SOLO taxonomy. Unfortunately, a straightforward comparison of mean scores on the SOLO taxonomy for students taught by NBCTs versus those taught by non-NBCTs would be misleading. This is so because the nature of student products depends critically upon the nature of the assignment given by the teacher. Some assignments (e.g., a piece of purely descriptive writing) do not lend themselves to a scoring analysis using the SOLO taxonomy since they are deliberately intended to be "surface" level exercises. With the aid of our teachers-in-residence, we will remove from the analysis all exercises that cannot be scored using the SOLO scoring scheme. Mean SOLO taxonomy scores of students taught by NBCTs and students taught by non-NBCT students on the remaining student products will be compared.

Analysis of Student and Teacher Affect

Student and teacher attitudes toward education and learning are important but often neglected aspects of schooling. As described in previous reports, we also obtained attitudinal and other affective information via students and teacher questionnaires. These will be factor analyzed and mean factor scores of certified and non-certified teachers as well as the corresponding student groups will be compared.

Analysis of Professional Activities and Involvement

The telephone interviews yielded 12 categories of information related to the amount and type of teachers' professional activities. Scoring rubrics for these categories have been developed and are being applied to the data.

We will investigate patterns of professional activity of certified and non-certified teachers via a discriminant function analysis. We will not conduct any formal statistical analyses of the telephone interview data related to how agencies make use of the expertise of NBCTs. The data will be catalogued and summarized so as to enable school systems to capitalize on the experiences of other systems.

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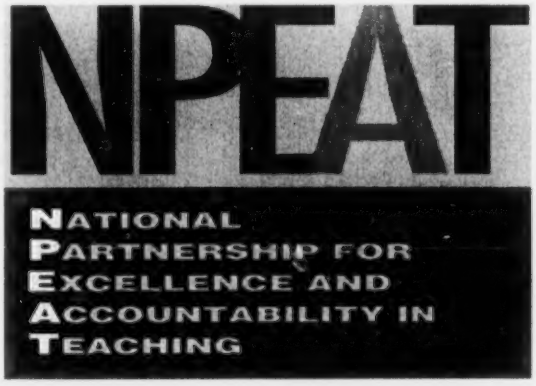

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